

Work Order ID **136114** 646.3510

136114

Page 1

Friday, August 28, 2015 1:49:01 PM

Item ID: 646.3510

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Strut

Start Date: 8/31/2015 Start Qty: 8.00 ***8***

Cust Item ID:

Required Date: 8/31/2015 Req'd Qty: 8.00 ***8***

Customer:

Reference:

Approvals: Process Plan: SH/LL Date: 20150831 Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
646.3500	<u>N/C 3</u>

110

0.00

110

Waterjet

FLOW CNC Waterjet

Memo

0.01

1-Cut 646.3500 plate 2.75"x 1.50" as per Dwg

Dwg Rev: N/C 3

Prog Rev: N/C

2-Deburr if necessary

(8) _____ 08/15/12

120

QC2- Inspect parts off machine FAI/FAIB

0.00

120

QC

Quality Control

Memo

0.00

(8) _____ 08/15/12

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QS1042) Approval		
Description Work Order Deviation				Disposition				Completed By	
								Lead hand / Supervisor Approval Verification	
								QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐								
Misidentified ☐	Past Due ☐								
		OTHER :							

136114

Page 2

N900040100

Setup Start *NS1*

Stop *NS2*

Start Date: 8/31/2015 **Start Qty:** 8.00 ***g***

Required Date: 8/31/2015 **Req'd Qty:** 8.00 ***O***

Customer:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

**Insp.
Stamp**

0.00

130

QC

Memo

0.00

Quality Control

NOV 12 2015

0,00

140

Small Fab

Memo

0.02

Small Fab

1- Fabricate tube as per dwg

QC5- Inspect part completeness to step on W/O

0.00

150

QC

Memo

0.00

Quality Control

DAS
9
9-89

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐		OTHER : ☐					

136114

Page 3

N900040100

Setup Start *NS1*

Stop ***NS2***

Reference:

Run Start *NR1*

Stop *NR2*

160

0.03

Weld tube to plate as per dwg. DT9867
Weld end were tube is punch.

QC9- Inspect visual per QSI004- Fusion Welds	0.00
--	------

170

Memo

Quality Control

QC5- Inspect part completeness to step on W/O	0.00
---	------

180

Memo

Quality Control

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval		
Description Work Order Deviation				Disposition				Completed By	
								Lead hand / Supervisor Approval Verification	
								QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____							
Misidentified ☐	Past Due ☐								

Work Order ID **136114**

Friday, August 28, 2015 1:49:01 PM

136114

Page 4

Item ID: **646.3510**

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Strut

Start Date: 8/31/2015 Start Qty: 8.00

8

Cust Item ID:

Required Date: 8/31/2015 Req'd Qty: 8.00

8

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
220		0.00							DAS
220						8			41
SprayPaint	Memo	0.00							9-89
Spray Painting	Prime as per dwg (see note 3)								15-12-10
	Batch: 132403								
230	QC14- Inspect Spray Paint	0.00							DAS
230						8	15-12-14		9
QC	Memo	0.00							9-89
Quality Control									
240		0.00							
240									
Packaging	Memo	0.00							
Packaging	***IDENTIFY AS PER APICAL MPP-120 BY STAMPING THE P# AND REV***								

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QS1042) Approval		
Description Work Order Deviation				Disposition				Completed By	
								Lead hand / Supervisor Approval Verification	
								QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐								
Misidentified ☐	Past Due ☐	OTHER :							

Work Order ID 136114

Friday, August 28, 2015 1:49:01 PM

136114

Page 5

Item ID: 646.3510

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Strut

Stop

NS2

Start Date: 8/31/2015 Start Qty: 8.00

g

Cust Item ID:

Required Date: 8/31/2015 Req'd Qty: 8.00

g

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

250

QC21- Final Inspection - Work Order Release

0.00

250

QC

Memo

0.01

Quality Control

ML5

DEC 15 2015

WLF
(5-1214)

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval		
Description Work Order Deviation				Disposition				Completed By	
								Lead hand / Supervisor Approval Verification	
								QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER :							
Misidentified ☐	Past Due ☐								

Picklist Print

Friday, August 28, 2015 1:49:04 PM

Page 1

Work Order ID: 136114

136114

Parent Item: 646.3510

646.3510

Parent Item Name: Strut

Start Date: 8/31/2015

Required Date: 8/31/2015

Start Qty: 8.00

Required Qty: 8.00

Comments: IPP REV:A 12.10.19 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

M304S16GA

Purchased

No

sf

283.1900

0.234105

M304S16GA

304/316 Sheet .063

08/15/11/12

Location

Loc Qty

Loc Code

MAT019

283.19

m131384

36

m131503

21.19

m132797

64

m132835

162

3

M304TR0.500W.049

Purchased

No

f

309.4211

7.014737

M304TR0 500W 049

304 RD Tube .500 x .049W

08/15/12-7

Location

Loc Qty

Loc Code

GA002

309.42113

M127937

9.4211

M128833

0.00003

M132872

300

*Mot'l used e/where
was scrapped and used
here - Not sure if pulled
on another w/o.*

130999

2 7.00'

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

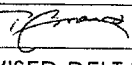
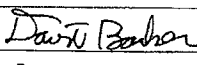
QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Skid-tube ☐</td> <td style="width:15%;">Cross tube ☐</td> <td style="width:15%;">Water Jet ☐</td> <td style="width:15%;">Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>				Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																																	
Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐																																																																		
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐																																																																		
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐																																																																		
Large Fab ☐	Composite ☐	Supplier ☐																																																																			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval																																																																	
Description Work Order Deviation		Disposition		Completed By																																																																	
				Lead hand / Supervisor Approval Verification																																																																	
				QC / QA Coordinator Approval																																																																	
Root Cause <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Environment ☐</td> <td style="width:15%;">No Re-verification ☐</td> </tr> <tr> <td>Design ☐</td> <td>Operator ☐</td> </tr> <tr> <td>Doc/Data ☐</td> <td>Offset/Setup ☐</td> </tr> <tr> <td>Equip/Tooling ☐</td> <td>Supplier ☐</td> </tr> <tr> <td>Handling/Pre ☐</td> <td>Training ☐</td> </tr> <tr> <td>Material ☐</td> <td>Use for Testing ☐</td> </tr> <tr> <td>Internal Transport ☐</td> <td>Poor Information ☐</td> </tr> <tr> <td>Tribal Knowledge ☐</td> <td>Rushing ☐</td> </tr> <tr> <td>LOA ☐</td> <td>Product Improvement ☐</td> </tr> <tr> <td>Substation ☐</td> <td>Process Improvement ☐</td> </tr> <tr> <td>Past Expiry Date ☐</td> <td>Manufacturing Process ☐</td> </tr> <tr> <td>Misidentified ☐</td> <td>Past Due ☐</td> </tr> </table>		Environment ☐	No Re-verification ☐	Design ☐	Operator ☐	Doc/Data ☐	Offset/Setup ☐	Equip/Tooling ☐	Supplier ☐	Handling/Pre ☐	Training ☐	Material ☐	Use for Testing ☐	Internal Transport ☐	Poor Information ☐	Tribal Knowledge ☐	Rushing ☐	LOA ☐	Product Improvement ☐	Substation ☐	Process Improvement ☐	Past Expiry Date ☐	Manufacturing Process ☐	Misidentified ☐	Past Due ☐	FAULT CATEGORY <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Pressure/Forced ☐</td> <td style="width:15%;">Temperature/Cure ☐</td> <td style="width:15%;">Power Loss/Surge ☐</td> <td style="width:15%;">Positioned Wrong ☐</td> </tr> <tr> <td>Bending ☐</td> <td>Set-up ☐</td> <td>Folio/Program ☐</td> <td>Outside Dimensions ☐</td> </tr> <tr> <td>Centre Not Concentric ☐</td> <td>BOM/Route ☐</td> <td>Grain ☐</td> <td>Over/Under tolerance ☐</td> </tr> <tr> <td>Cracks ☐</td> <td>Broken/Damage/Defect ☐</td> <td>Weld ☐</td> <td>Part Incorrect ☐</td> </tr> <tr> <td>Crimp/Kink/Ripple/Wave ☐</td> <td>Inspection Incomplete/Unqualified ☐</td> <td>Wrong Stock Pulled ☐</td> <td>Part Lost/Missing ☐</td> </tr> <tr> <td>Cuffs ☐</td> <td>Contamination ☐</td> <td>Out of Sequence ☐</td> <td>Part Moved ☐</td> </tr> <tr> <td>Crushing ☐</td> <td>Countersink ☐</td> <td>Off-set ☐</td> <td>Drawing ☐</td> </tr> <tr> <td>Heat Treat ☐</td> <td>Cut Too Short ☐</td> <td>Mislabeled ☐</td> <td>Finish ☐</td> </tr> <tr> <td>Wave/Twist in Tube ☐</td> <td>Instructions Incomplete/Unclear ☐</td> <td>Fit/Function ☐</td> <td>Misread ☐</td> </tr> <tr> <td>Marks/Chatter ☐</td> <td>Drill Holes ☐</td> <td>Misaligned/off center ☐</td> <td>Turning Sequence ☐</td> </tr> </table>				Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐
Environment ☐	No Re-verification ☐																																																																				
Design ☐	Operator ☐																																																																				
Doc/Data ☐	Offset/Setup ☐																																																																				
Equip/Tooling ☐	Supplier ☐																																																																				
Handling/Pre ☐	Training ☐																																																																				
Material ☐	Use for Testing ☐																																																																				
Internal Transport ☐	Poor Information ☐																																																																				
Tribal Knowledge ☐	Rushing ☐																																																																				
LOA ☐	Product Improvement ☐																																																																				
Substation ☐	Process Improvement ☐																																																																				
Past Expiry Date ☐	Manufacturing Process ☐																																																																				
Misidentified ☐	Past Due ☐																																																																				
Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐																																																																		
Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐																																																																		
Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐																																																																		
Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐																																																																		
Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐																																																																		
Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐																																																																		
Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐																																																																		
Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐																																																																		
Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐																																																																		
Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐																																																																		
		OTHER : _____																																																																			

20150831

SH 136114

APICAL INDUSTRIES, INC.	ENGINEERING CHANGE NOTICE NO. 04274				SHEET 1 OF 1	
	DWG NO. 646.3500	REV: NC	PREPARED BY J. SOTO	DATE: 12/02/2013	EFFECT ON DWG ☐ INC. ☒ UNINC.	
	DWG TITLE: STRUT					
	APPROVED BY: ENGR 	MFG 	QC 	EFF. NEXT ORDER		
TRANSACTION CODES (TC): A-ADD R-REVISE C-CREATE D-DELETE	REASON: REVISED DELTA NOTE 1 & 2.					

SHEET 1, ZONE A1 IS:

IS

NOTES:

- 1 MATERIAL: AISI 304/ 316 SS SHEET .062 THK
(REF DART SPEC. M304S16GA)
- 2 MATERIAL: AISI 304/316 SS 0.500 OD X 0.049 WALL
(REF DART SPEC. M304TR0.500W0.049)
ENSURE SEAMLESS TUBE IS USED
- 3 FINISH: HARD ANODIZE IAW MIL-A-8625 TYPE III, CLASS 2
COLOR BLACK;
CARDINAL 4860-50 PRETREATMENT PRIMER
PRIME IAW MIL-P-23377J TYPE I CLASS N
4. DEBURR AND BREAK ALL SHARP EDGES
5. WELDS IAW MIL-STD-2219.
TIG WELD WITH FILLER ROD

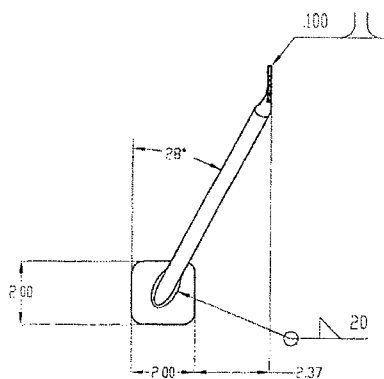
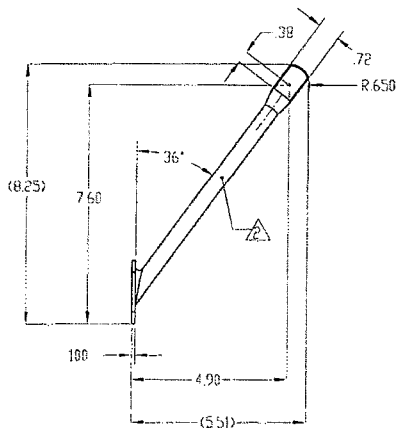
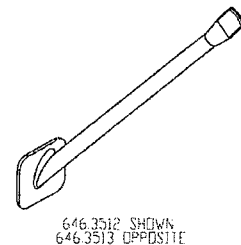
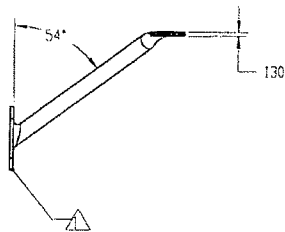
DOCUMENTS EFFECTED:	☐ MDL ☐ INSTALL INSTRUCTIONS ☐ ICA ☐ FMS ☐ BOM	CHANGE CATEGORY ☐ MAJOR ☒ MINOR	DER REVIEW REQUIRED ☐ YES ☒ NO
---------------------	---	---	--

APICAL
INDUSTRIES, INC.

ENGINEERING CHANGE NOTIC. NO. 02440		SHEET 1 OF 1	
DWG NO. 646.3500	REV: NC	PREPARED BY S. HUFF	DATE 06/08/09
DWG TITLE: STRUT		EFFECT ON DWG ☐ INC. ☒ UNINC.	
APPROVED BY: ENGR <i>[Signature]</i>	MFG <i>[Signature]</i>	QC <i>[Signature]</i>	EFF: CURRENT ORDER AND STOCK
REASON: REVISED GEOMETRY TO ACCOMMODATE NEW EXISTING AIRCRAFT PROVISIONS			

TRANSACTION CODES (TC):
A-ADD C-CREATE
R-REVISE D-DELETE

SHEET 2 IS:



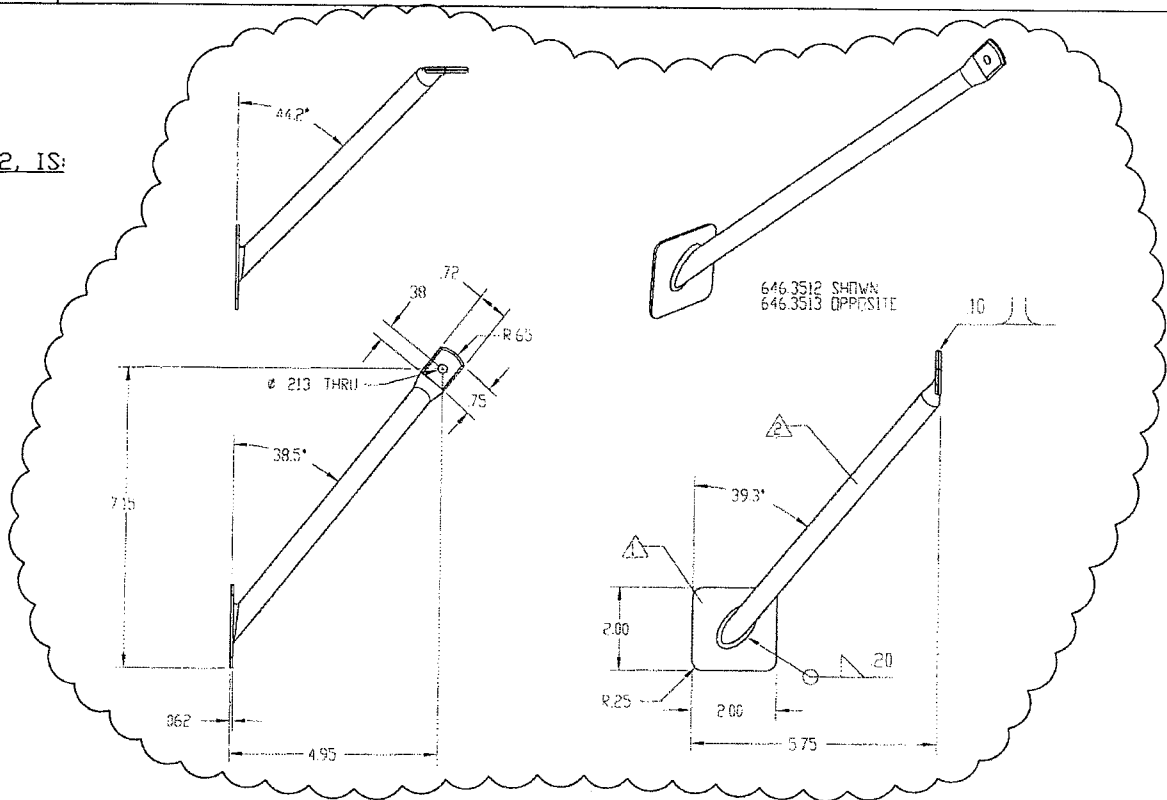
DOCUMENTS EFFECTED:	☐ MDL ☐ INSTALL INSTRU ☐ ICA ☐ FMS ☐ BOM	CHANGE CATEGORY ☐ MAJOR ☒ MINOR	DER REVIEW REQUIRED ☐ YES ☒ NO
---------------------	---	---	--

APICAL
INDUSTRIES, INC.

ENGINEERING CHANGE NOTICE NO. 02197		SHEET 1 OF 1	
DWG NO. 646.3500	REV: N/C	PREPARED BY S. HUFF	DATE: 01/05/09
DWG TITLE: STRUT		EFFECT ON DWG ☐ INC. ☒ UNINC.	
APPROVED BY: ENGR <i>[Signature]</i>	MFG <i>[Signature]</i>	QC <i>[Signature]</i>	EFF: NEXT ORDER
REASON: REVISED ANGLE OF 646.3512 & 646.3513 FOR BETTER FITMENT			

TRANSACTION CODES (TC):
A-ADD C-CREATE
R-REVISE D-DELETE

SHEET 2, IS:

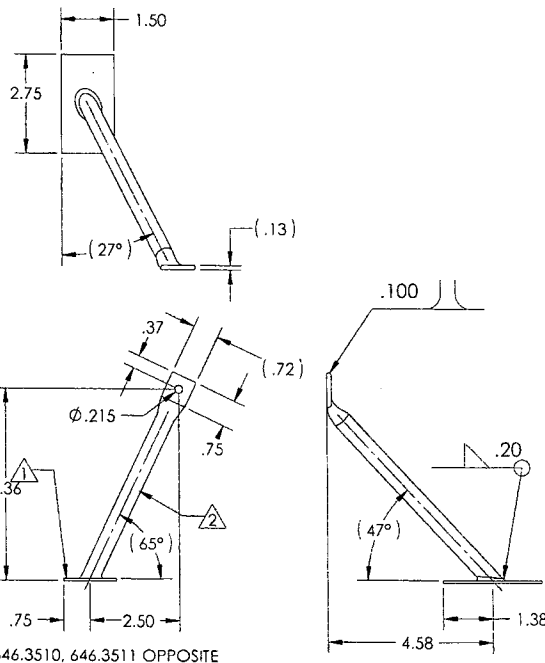


DOCUMENTS EFFECTED:	☐ MDL ☐ INSTALL INSTRU ☐ ICA ☐ FMS ☐ BOM	CHANGE CATEGORY ☐ MAJOR ☒ MINOR	DER REVIEW REQUIRED ☐ YES ☒ NO
---------------------	---	---	--

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF APICAL INDUSTRIES AND REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF APICAL INDUSTRIES IS PROHIBITED

NOTES:

- 1 MATERIAL: 6061-T6 ALUMINUM IAW AMS-QQ-A-250/11;
.062" THK.
- 2 MATERIAL: 6061-T6 ALUMINUM IAW AMS-WW-T-700/6
.500" OD; .062" WALL THK
- 3 FINISH: HARD ANODIZE IAW MIL-A-8625 TYPE III, CLASS 2
COLOR BLACK;
CARDINAL 4860-50 PRETREATMENT PRIMER
PRIME IAW MIL-P-23377J TYPE I CLASS N
4. DEBURR AND BREAK ALL SHARP EDGES
5. WELDS IAW MIL-STD-2219;
TIG WELD WITH FILLER ROD



646.3510, 646.3511 OPPOSITE

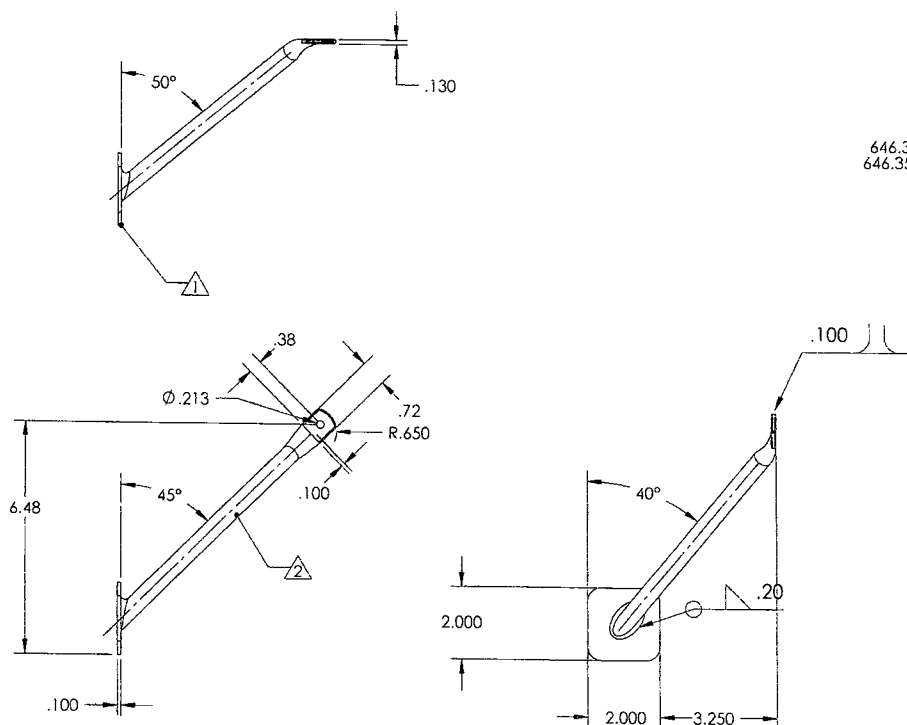
646.3510 SHOWN
646.3511 OPPOSITE

UNINCORPORATED ECN(S)
02197, 02440, 04274

QTY	FIND #	PART #	DESCRIPTION	MATL	SPEC.
		646.3513	STRUT	△△	△
		646.3512	STRUT	△△	△
		646.3511	STRUT	△△	△
		646.3510	STRUT	△△	△
PARTS LIST					
APICAL INDUSTRIES					
2608 TEMPLE HEIGHTS DR.					
OCEANSIDE, CA. 92056-3512 (760)724-5300					
STRUT					
646.3500					
SCALE: NONE					
1 SHEET OF 2					

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF APICAL INDUSTRIES AND REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF APICAL INDUSTRIES IS PROHIBITED

646.3512 SHOWN
646.3513 OPPOSITE



PROPERTY NO.	DESIGN	APICAL INDUSTRIES	
PROJECT NO.	PROJECT	2608 TEMPLE HEIGHTS DR.	
1. DESCRIPTION	ITEM NO.	OCEANSIDE, CA. 92056-2512 (760)724-5300	
2. DRAWING	DATE		
3. REVISED	DATE		
4. APPROVED	DATE		
5. CHECKED	DATE		
6. DESIGNED	DATE		
7. DRAWN	DATE		
8. CHECKED	DATE		
9. APPROVED	DATE		
10. DESIGNED	DATE		
11. DRAWN	DATE		
12. CHECKED	DATE		
13. APPROVED	DATE		
14. DESIGNED	DATE		
15. DRAWN	DATE		
16. CHECKED	DATE		
17. APPROVED	DATE		
18. DESIGNED	DATE		
19. DRAWN	DATE		
20. CHECKED	DATE		
21. APPROVED	DATE		
22. DESIGNED	DATE		
23. DRAWN	DATE		
24. CHECKED	DATE		
25. APPROVED	DATE		
26. DESIGNED	DATE		
27. DRAWN	DATE		
28. CHECKED	DATE		
29. APPROVED	DATE		
30. DESIGNED	DATE		
31. DRAWN	DATE		
32. CHECKED	DATE		
33. APPROVED	DATE		
34. DESIGNED	DATE		
35. DRAWN	DATE		
36. CHECKED	DATE		
37. APPROVED	DATE		
38. DESIGNED	DATE		
39. DRAWN	DATE		
40. CHECKED	DATE		
41. APPROVED	DATE		
42. DESIGNED	DATE		
43. DRAWN	DATE		
44. CHECKED	DATE		
45. APPROVED	DATE		
46. DESIGNED	DATE		
47. DRAWN	DATE		
48. CHECKED	DATE		
49. APPROVED	DATE		
50. DESIGNED	DATE		
51. DRAWN	DATE		
52. CHECKED	DATE		
53. APPROVED	DATE		
54. DESIGNED	DATE		
55. DRAWN	DATE		
56. CHECKED	DATE		
57. APPROVED	DATE		
58. DESIGNED	DATE		
59. DRAWN	DATE		
60. CHECKED	DATE		
61. APPROVED	DATE		
62. DESIGNED	DATE		
63. DRAWN	DATE		
64. CHECKED	DATE		
65. APPROVED	DATE		
66. DESIGNED	DATE		
67. DRAWN	DATE		
68. CHECKED	DATE		
69. APPROVED	DATE		
70. DESIGNED	DATE		
71. DRAWN	DATE		
72. CHECKED	DATE		
73. APPROVED	DATE		
74. DESIGNED	DATE		
75. DRAWN	DATE		
76. CHECKED	DATE		
77. APPROVED	DATE		
78. DESIGNED	DATE		
79. DRAWN	DATE		
80. CHECKED	DATE		
81. APPROVED	DATE		
82. DESIGNED	DATE		
83. DRAWN	DATE		
84. CHECKED	DATE		
85. APPROVED	DATE		
86. DESIGNED	DATE		
87. DRAWN	DATE		
88. CHECKED	DATE		
89. APPROVED	DATE		
90. DESIGNED	DATE		
91. DRAWN	DATE		
92. CHECKED	DATE		
93. APPROVED	DATE		
94. DESIGNED	DATE		
95. DRAWN	DATE		
96. CHECKED	DATE		
97. APPROVED	DATE		
98. DESIGNED	DATE		
99. DRAWN	DATE		
100. CHECKED	DATE		
101. APPROVED	DATE		
102. DESIGNED	DATE		
103. DRAWN	DATE		
104. CHECKED	DATE		
105. APPROVED	DATE		
106. DESIGNED	DATE		
107. DRAWN	DATE		
108. CHECKED	DATE		
109. APPROVED	DATE		
110. DESIGNED	DATE		
111. DRAWN	DATE		
112. CHECKED	DATE		
113. APPROVED	DATE		
114. DESIGNED	DATE		
115. DRAWN	DATE		
116. CHECKED	DATE		
117. APPROVED	DATE		
118. DESIGNED	DATE		
119. DRAWN	DATE		
120. CHECKED	DATE		
121. APPROVED	DATE		
122. DESIGNED	DATE		
123. DRAWN	DATE		
124. CHECKED	DATE		
125. APPROVED	DATE		
126. DESIGNED	DATE		
127. DRAWN	DATE		
128. CHECKED	DATE		
129. APPROVED	DATE		
130. DESIGNED	DATE		
131. DRAWN	DATE		
132. CHECKED	DATE		
133. APPROVED	DATE		
134. DESIGNED	DATE		
135. DRAWN	DATE		
136. CHECKED	DATE		
137. APPROVED	DATE		
138. DESIGNED	DATE		
139. DRAWN	DATE		
140. CHECKED	DATE		
141. APPROVED	DATE		
142. DESIGNED	DATE		
143. DRAWN	DATE		
144. CHECKED	DATE		
145. APPROVED	DATE		
146. DESIGNED	DATE		
147. DRAWN	DATE		
148. CHECKED	DATE		
149. APPROVED	DATE		
150. DESIGNED	DATE		
151. DRAWN	DATE		
152. CHECKED	DATE		
153. APPROVED	DATE		
154. DESIGNED	DATE		
155. DRAWN	DATE		
156. CHECKED	DATE		
157. APPROVED	DATE		
158. DESIGNED	DATE		
159. DRAWN	DATE		
160. CHECKED	DATE		
161. APPROVED	DATE		
162. DESIGNED	DATE		
163. DRAWN	DATE		
164. CHECKED	DATE		
165. APPROVED	DATE		
166. DESIGNED	DATE		
167. DRAWN	DATE		
168. CHECKED	DATE		
169. APPROVED	DATE		
170. DESIGNED	DATE		
171. DRAWN	DATE		
172. CHECKED	DATE		
173. APPROVED	DATE		
174. DESIGNED	DATE		
175. DRAWN	DATE		
176. CHECKED	DATE		
177. APPROVED	DATE		
178. DESIGNED	DATE		
179. DRAWN	DATE		
180. CHECKED	DATE		
181. APPROVED	DATE		
182. DESIGNED	DATE		
183. DRAWN	DATE		
184. CHECKED	DATE		
185. APPROVED	DATE		
186. DESIGNED	DATE		
187. DRAWN	DATE		
188. CHECKED	DATE		
189. APPROVED	DATE		
190. DESIGNED	DATE		
191. DRAWN	DATE		
192. CHECKED	DATE		
193. APPROVED	DATE		
194. DESIGNED	DATE		
195. DRAWN	DATE		
196. CHECKED	DATE		
197. APPROVED	DATE		
198. DESIGNED	DATE		
199. DRAWN	DATE		
200. CHECKED	DATE		
201. APPROVED	DATE		
202. DESIGNED	DATE		
203. DRAWN	DATE		
204. CHECKED	DATE		
205. APPROVED	DATE		
206. DESIGNED	DATE		
207. DRAWN	DATE		
208. CHECKED	DATE		
209. APPROVED	DATE		
210. DESIGNED	DATE		
211. DRAWN	DATE		
212. CHECKED	DATE		
213. APPROVED	DATE		
214. DESIGNED	DATE		
215. DRAWN	DATE		
216. CHECKED	DATE		
217. APPROVED	DATE		
218. DESIGNED	DATE		
219. DRAWN	DATE		
220. CHECKED	DATE		
221. APPROVED	DATE		
222. DESIGNED	DATE		
223. DRAWN	DATE		
224. CHECKED	DATE		
225. APPROVED	DATE		
226. DESIGNED	DATE		
227. DRAWN	DATE		
228. CHECKED	DATE		
229. APPROVED	DATE		
230. DESIGNED	DATE		
231. DRAWN	DATE		
232. CHECKED	DATE		
233. APPROVED	DATE		
234. DESIGNED	DATE		
235. DRAWN	DATE		
236. CHECKED	DATE		
237. APPROVED	DATE		
238. DESIGNED	DATE		
239. DRAWN	DATE		
240. CHECKED	DATE		
241. APPROVED	DATE		
242. DESIGNED	DATE		
243. DRAWN	DATE		
244. CHECKED	DATE		
245. APPROVED	DATE		
246. DESIGNED	DATE		
247. DRAWN	DATE		
248. CHECKED	DATE		
249. APPROVED	DATE		
250. DESIGNED	DATE		
251. DRAWN	DATE		
252. CHECKED	DATE		
253. APPROVED	DATE		
254. DESIGNED	DATE		
255. DRAWN	DATE		
256. CHECKED	DATE		
257. APPROVED	DATE		
258. DESIGNED	DATE		
259. DRAWN	DATE		
260. CHECKED	DATE		
261. APPROVED	DATE		
262. DESIGNED	DATE		
263. DRAWN	DATE		
264. CHECKED	DATE		
265. APPROVED	DATE		
266. DESIGNED	DATE		
267. DRAWN	DATE		
268. CHECKED	DATE		
269. APPROVED	DATE		
270. DESIGNED	DATE		
271. DRAWN	DATE		
272. CHECKED	DATE		
273. APPROVED	DATE		
274. DESIGNED	DATE		
275. DRAWN	DATE		
276. CHECKED	DATE		
277. APPROVED	DATE		
278. DESIGNED	DATE		
279. DRAWN	DATE		
280. CHECKED	DATE		
281. APPROVED	DATE		
282. DESIGNED	DATE		
283. DRAWN	DATE		
284. CHECKED	DATE		
285. APPROVED	DATE		
286. DESIGNED	DATE		
287. DRAWN	DATE		
288. CHECKED	DATE		
289. APPROVED	DATE		
290. DESIGNED	DATE		
291. DRAWN	DATE		
292. CHECKED	DATE		
293. APPROVED	DATE		
294. DESIGNED	DATE		
295. DRAWN	DATE		
296. CHECKED	DATE		
297. APPROVED	DATE		
298. DESIGNED	DATE		
299. DRAWN	DATE		
300. CHECKED	DATE		
301. APPROVED	DATE		
302. DESIGNED	DATE		
303. DRAWN	DATE		
304. CHECKED	DATE		
305. APPROVED	DATE		
306. DESIGNED	DATE		
307. DRAWN	DATE		
308. CHECKED	DATE		
309. APPROVED	DATE		
310. DESIGNED	DATE		
311. DRAWN	DATE		
312. CHECKED	DATE		
313. APPROVED	DATE		
314. DESIGNED	DATE		
315. DRAWN	DATE		
316. CHECKED	DATE		
317. APPROVED	DATE		
318. DESIGNED	DATE		
319. DRAWN	DATE		
320. CHECKED	DATE		
321. APPROVED	DATE		
322. DESIGNED	DATE		
323. DRAWN	DATE		
324. CHECKED	DATE		
325. APPROVED	DATE		
326. DESIGNED	DATE		
327. DRAWN	DATE		
328. CHECKED	DATE		
329. APPROVED	DATE		
330. DESIGNED	DATE		
331. DRAWN	DATE		
332. CHECKED	DATE		
333. APPROVED	DATE		
334. DESIGNED	DATE		
335. DRAWN	DATE		
336. CHECKED	DATE		
337. APPROVED	DATE		
338. DESIGNED	DATE		
339. DRAWN	DATE		
340. CHECKED	DATE		
341. APPROVED	DATE		
342. DESIGNED	DATE		
343. DRAWN	DATE		
344. CHECKED	DATE		
345. APPROVED	DATE		
346. DESIGNED	DATE		
347. DRAWN	DATE		
348. CHECKED	DATE		
349. APPROVED	DATE		
350. DESIGNED	DATE		
351. DRAWN	DATE		
352. CHECKED	DATE		
353. APPROVED	DATE		
354. DESIGNED	DATE		
355. DRAWN	DATE		
356. CHECKED	DATE		
357. APPROVED	DATE		
358. DESIGNED	DATE		
359. DRAWN	DATE		
360. CHECKED	DATE		
361. APPROVED	DATE		
362. DESIGNED	DATE		
363. DRAWN	DATE		
364. CHECKED	DATE		
365. APPROVED	DATE		
366. DESIGNED	DATE		
367. DRAWN	DATE		
368. CHECKED	DATE		
369. APPROVED	DATE		
370. DESIGNED	DATE		
371. DRAWN	DATE		
372. CHECKED	DATE		
373. APPROVED	DATE		
374. DESIGNED	DATE		
375. DRAWN	DATE		
376. CHECKED	DATE		
377. APPROVED	DATE		
378. DESIGNED	DATE		
379. DRAWN	DATE		
380. CHECKED	DATE		
381. APPROVED	DATE		
382. DESIGNED	DATE		
383. DRAWN	DATE		
384. CHECKED	DATE		
385. APPROVED	DATE		
386. DESIGNED	DATE		
387. DRAWN	DATE		
388. CHECKED	DATE		
389. APPROVED	DATE		
390. DESIGNED	DATE		
391. DRAWN	DATE		
392. CHECKED	DATE		
393. APPROVED	DATE		
394. DESIGNED	DATE		
395. DRAWN	DATE		
396. CHECKED	DATE		
397. APPROVED	DATE		
398. DESIGNED	DATE		
399. DRAWN	DATE		
400. CHECKED	DATE		
401. APPROVED	DATE		
402. DESIGNED	DATE		
403. DRAWN	DATE		
404. CHECKED	DATE		
405. APPROVED	DATE		
406. DESIGNED	DATE		
407. DRAWN	DATE		
408. CHECKED	DATE		
409. APPROVED	DATE		
410. DESIGNED	DATE		
411. DRAWN	DATE		
412. CHECKED	DATE		
413. APPROVED	DATE		
414. DESIGNED	DATE		
415. DRAWN	DATE		
416. CHECKED	DATE		
417. APPROVED	DATE		
418. DESIGNED	DATE		
419. DRAWN	DATE		
420. CHECKED	DATE		
421. APPROVED	DATE		
422. DESIGNED	DATE		
423. DRAWN	DATE		
424. CHECKED	DATE		
425. APPROVED	DATE		
426. DESIGNED	DATE		
427. DRAWN	DATE		
428. CHECKED	DATE		
429. APPROVED	DATE		
430. DESIGNED	DATE		
431. DRAWN	DATE		
432. CHECKED	DATE		
433. APPROVED	DATE		
434. DESIGNED	DATE		
435. DRAWN	DATE		
436. CHECKED	DATE		
437. APPROVED	DATE		
438. DESIGNED	DATE		
439. DRAWN	DATE		
440. CHECKED	DATE		
441. APPROVED	DATE		
442. DESIGNED	DATE		
443. DRAWN			

